OFFICE OF MANNED SPACE FLIGHT PROGRAM DIRECTIVE	M-D ML 3200-068 (Project)	DATE May 23, 1968

APOLLO APPLICATIONS
Director, PROGRAM DIRECTIVE NO. 15

): SUPERSESSION KMI 5310.13

~~This Instruction~~ supersedes all portions of KSC Apollo Program Directive No. 15 that pertain to reliability and quality assurance plans.

BJECT: Management Procedures for the Planning and Implementation of AAP Experiments

I. PURPOSE

The purpose of this directive is as follows:

A. Provide the procedures for the preparation and approval of the Experiment Implementation Plan (EIP), NASA Form 1347, for the Apollo Applications Program.

B. Define and establish the management procedures for the development, integration, and flight of experiments following assignment of the experiments to the Apollo Applications Program.

I. SCOPE AND APPLICABILITY

This directive applies to all elements of NASA participating in the planning and implementation of AAP experiments.

I. CANCELLATION

NASA Program Office Operating Instruction ML-SAAI-1230.1, subject, Experiment Implementation Plan (EIP)-NASA Form 1347, date April 14, 1967, is hereby cancelled and the provisions thereof incorporated in this document.

V. PROGRAM DOCUMENTS

The documents listed in Appendix (A) shall be used within the scope of their applicability with this directive.

V. PROCEDURES

The Management Procedures to be followed for the Apollo Applications experiments are divided into two phases - a Planning Phase and an Implementation Phase.

A. Planning Phase - This phase begins when the experiment is referred to the AAP office for compatibility assessment and implementation planning. An Experiment Implementation Plan, Form 1347, will be prepared to reflect the plans of the development, integration, mission operations, and launch operations centers. The plan will provide the following information:

1. Describe the experiments, establish the baseline configuration of the experiment hardware, and identify the number and type of deliverable items including GSE.

2. Identify the task, resources, and the time needed to develop, integrate and perform a manned space flight experiment.

3. Provide the data required to establish compatibility of the experiment with the Apollo Applications Program.

4. Define the management arrangements required for the implementation of the experiment.

5. Provide the baseline for status reporting of resources and schedules.

Attachment (1) highlights the procedures to be followed in the preparation, coordination, and approval of an EIP. The Apollo Applications Program Office will issue requests for EIP's and provide available experiment documentation needed to initiate EIP preparation. The EIP will be submitted to the AAP Headquarters Office for Headquarters' review and approval. The EIP will be prepared jointly by all Centers participating in the experiment. Coordination and submission responsibility will be assigned by NASA Headquarters AAP Office.

B. Implementation Phase - Implementation is initiated with program authority based on the approved EIP. Experiment implementation is all the activity involved in the acquisition of experiment hardware, preparation of hardware for operational (flight) use, performance of flight operations, and disposition of experiment data. It proceeds through all phases of activity to completion supported by a continuous management effort of coordination, review and approval. An Experiment Requirements Document (ERD) will be prepared at the beginning of this phase by the Experiment Development Center. The ERD will consist of a complete description of the experiment including its requirements and constraints in sufficient detail to permit preparation of correlated supporting documents by the Experiment Integration Center, the Mission Operations Center and the Launch Operations Center. The programmatic information as defined in Section VII of the EIP will be excluded from the ERD. The ERD will be updated whenever significant changes occur, or at least quarterly, to reflect requirement changes and current status and be used as source for experiment information throughout the implementation phase. Attachment (2) presents the general procedures for directing the implementation activity and it shows the relationships of all centers participating in the effort.

I. RESPONSIBILITIES

A. NASA Headquarters Apollo Applications Program Office - The AAP Office has overall direction and responsibility for the program including the following:

1. Issues requests for preparation of the Experiment Implementation Plan and Compatibility Study.

2. Approves Experiment Implementation Plans.

3. Presents recommendations on experiment compatibility to the MSFEB.

4. Assigns experiments to missions and spacecraft modules.

5. Issues Program Authority to appropriate NASA Centers to initiate experiment implementation.

6. Provides general guidelines and direction.

7. Conducts review and evaluation.

8. Insures proper coordination, review, and support with the experiment sponsor.

B. Inter-Center Interface Panel Organization - The Interface Panel Organization, established by OMSF Program Directive M-D ML 3200.069, dated September 21, 1967 (Apollo Applications Directive No. 7) will be utilized in the Apollo Applications Experiments Program to define and control inter-center interfaces and resolve related interface problems.

C. Experiment Development Center - The EDC is responsible for the design, development, test, checkout, and operational support requirements of experiment hardware and ground support equipment. In addition, the Center is responsible for the following:

1. Coordinating, preparing and submitting Experiment Implementation Plans for experiments requested by NASA Headquarters AAP Office and/or participating in the preparation of EIP's assigned to another center.

2. Working closely with the Principal Investigator to assure that the EIP is consistent with his Experiment Proposal and accurately reflects the technical requirements of the experiment.

3. Providing experiment development planning and current technical, engineering and operational data needed to perform the integration studies.

4. Establishing experiment hardware and software specifications in coordination with other centers' requirements.

5. Preparing, up-dating, and distributing the Experiment Requirements Document (ERD).

6. Contracting for the design, development, fabrication and testing of experiment hardware, software, and special GSE.

7. Supporting as required, the Experiment Integration Center, the Mission Operations Center, the Launch Operations Center, and the Inter-Center Interface Panels.

8. Providing for the disposition of experimental data and equipments at the end of the mission.

D. Experiment Integration Center (Module Development Center) - The Experiment Integration Center is the Module Development Center which is responsible for the integration of the experiment into its module. Each experiment will be integrated into the carrier modules in which the experiment is positioned during launch, where it is performed during flight, and where it is placed after operation for either reuse or return.

1. The Center(s) is (are) responsible for the following:

a. Providing and reviewing integration requirements with the EDC in proper timing with the development phase of the program.

b. Preparing, updating and distributing an Experiment Integration Requirements Document (EIRD). This correlated supporting document to the ERD will define experiment/carrier interface requirements and identify GSE requirements for experiment/carrier integration and checkout. It will serve as the basis for preparation of Interface Control Documents (ICD's). If an experiment interfaces with modules which are different for launch, performance and/or return, separate EIRD's will be prepared, as necessary, for each experiment/carrier interface.

c. Preparing Experiment Integration ICD's.

d. Design, develop, manufacture, integration and test of on-board experiment common support equipment.

e. Support, as required, the Experiment Development Center, the Missions Operations Center, the Launch Operations Center, and the Inter-Center Interface Panels.

2. In addition to the above, the Experiment Integration Center responsible for integrating the experiment into the launch carrier is also responsible for the following:

a. Coordinating, preparing and submitting Experiment Implementation Plans for experiments requested by NASA Headquarters AAP Office and/or participating in the preparation of EIP's assigned to another center.

b. Assist non-OMSF Experiment Development Centers in the development of assigned experiments as required.

c. Monitor development of Department of Defense designated experiments to assure that all NASA requirements are satisfied, i.e., documentation qualification, integration, training and operational support. In performance of this function, the EIC will coordinate experiment requirements with DOD and NASA organizations as appropriate.

E. Mission Operations Center (MSC) - In its role as the Mission Operations Center, MSC is responsible for:

1. Participation in the preparation of EIP's.

2. Performance of flight experiment operation, flight crew experiment operations, and experiment safety requirements.

3. Training and crew preparation necessary to perform the experiment.

4. Preparing, updating and distributing a correlated supporting document to the ERD to reflect the experiment crew training, flight operation, flight safety and recovery requirements and constraints to all centers participating in the experiment program.

5. Support, as required, the Experiment Development Center, the Experiment Integration Center, the Launch Operations Center, and the Inter-Center Interface Panels.

F. Launch Operations Center (KSC) - KSC shall include, in its role as the Launch Operations Center, responsibility for experiments as follows:

1. Participate in the preparation of EIP's.

2. Provide prelaunch, launch operations and launch support for experiments as required.

3. Furnish common support equipment for experiments as required.

4. Perform out-of-station installation of experiment equipment.

5. Develop prelaunch and launch plans and procedures and conduct test and checkout of experiment hardware in consonance with the Experiment Development Center and the Experiment Integration Center requirements.

6. Preparing, updating and distributing a correlated supporting document to the ERD to define prelaunch and launch procedures and test and checkout requirements and constraints.

G. Principal Investigator - The role of the Principal Investigator for the experiment is as specified in paragraph 8 of NMI 7100.1, subject, Conduct of Space Science Program - Selection and Support of Scientific Investigations and Investigators. Although this NMI applies to science experiments, it is also applicable to all experiments assigned to the Apollo Applications Program. The specific requirements of the Principal Investigator are established by agreement with the Experiment Development Center.

H. Sponsoring Office - The Sponsoring Office has a continuing responsibility for monitoring the scientific and technical integrity of its experiment and maintains a close relationship with the AAP Headquarters Office, the

Principal Investigator and the Experiment Development Center throughout the life of the experiment. Through membership in the Mission Planning Task Force, participates in the mission planning.

RESOURCES

The baseline experiment resources document is the cost and obligation plan contained in the Experiment Implementation Plan (EIP) as approved by AA/MSF. Subsequent revisions to resources requirements are to be documented as follows:

A. After AA/MSF approval and until Critical Design Review (CDR), revised resources requirements for experiments development will be covered by the approval of POP submits.

B. After CDR, in addition to the POP, revised cost estimates will be included in the Contract Change Notices required by Configuration Management policies.

PROCUREMENT

Determination of the best method for procurement will be made during the planning phase taking into account the nature of the experiment, integration consideration, cost and schedule, the desire of the Principal Investigator, etc. Development of experiment hardware may be procured either directly through contract with the Principal Investigator or by a separate hardware contract. The plans for procurement of experiment hardware will be prepared by the Experiment Development Center in conjunction with the P. I. and made a part of the EIP.

REPORTING

Reporting will be as specified by separate OMSF and AAP direction. The EIC responsible for the experiment at launch is responsible for reporting status of DOD experiments.

ABBREVIATIONS

Abbreviations of terminology peculiar to the AAP Experiment Program used in this directive are defined in Appendix (B). For definitions of standard terms, reference should be made to NASA NHB 2330.2A, subject, Standard Abbreviations for Manned Space Flight Scheduling.

APPENDIX (A)
PROGRAM DOCUMENTS

1. PDP - The Program Development Plan provides a summary of the objectives, policies, principles, practices and requirements of the program and defines the missions and roles of the centers.

2. AAP Program Specification - The Program Specification contains overall requirements and definitions for all missions as an entity.

3. AAP Experiment Specification - The AAP Experiment General Specification outlines the general requirements for the design, development, test and operational use of experiment hardware and support items. It is applicable to both Center and contractual activities. (Pending issuance of the final specification, an Interim Experiment General Specification, dated February 1968 was issued for Design Requirements Baseline used at PDR.)

4. NASA Form 506A - The Resources Authority Warrant is prepared and issued for the control of resources and Civil Service Manpower authorizations as described in NMI 8020.1A, dated September 25, 1967.

5. EIP - The Experiment Implementation Plan, NASA Form 1347, December 1967, provides the guidelines and requirements to initiate experiment development and experiment operations planning, and the schedule and funding requirements including therein shall be used as a baseline for POP and SARP reporting.

6. AAP Reliability and Quality Assurance Program Plan - The R and QA Program Plan, NHB 5300.5, May 1967, sets forth the requirements for implementing and evaluating the Apollo Applications Reliability and Quality Assurance Program.

7. Apollo Applications Test Requirements - The AAP Test Requirements document, NHB 8080.3, October 13, 1967, provides the test policy/criteria and establishes the requirements for test and test documentation for the Apollo Applications Program.

8. Configuration Management Requirements Document - This document establishes uniform configuration management requirements and procedures which accurately define all AAP equipment throughout its lifetime. (Draft in circulation).

9. OMSF Program Directive M-D ML 3200 084, February 26, 1968, Apollo Applications Program Directive No. 11, subject, Sequence and Flow of Hardware Development and Key Inspection, Review and Certification Checkpoints.

.0. Joint Apollo and AAP Safety Program Plan - The safety program plan (draft in circulation) establishes safety requirements for all Apollo Applications hardware including experiments.

.I. AAP Flight Mission Assignments - These documents contain the flight mission assignments, which include the primary missions, the backup missions and real-time alternates for the Apollo Applications Program. Included in these documents are the assignments of experiments to the missions.

APPENDIX (A)
PROGRAM DOCUMENTS

12. AAP Flight Mission Directives - These directives define AAP requirements and responsibilities to initiate those actions prerequisite to excecution of the missions.

13. NPD 8030.3, Policy Concerning Data Obtained From Space Science Flight Experiments - This directive establishes the policy and responsibilities for reduction, analysis, preservation and dissemination of data obtained from space science flight experiments.

14. Draft NPD, Policy Concerning Data Obtained from Manned Space Flight Experiments - This directive establishes the policy and responsibility for the reduction, analysis, publication, presentation, and dissemination of data obtained from manned space flight experiments.

APPENDIX (B)
ABBREVIATIONS

CEI	Contract End Item
CI	Configuration Inspection (Formerly FACI)
COFW	Certificate of Flight Worthiness
EIC	Experiment Integration Center
EDC	Experiment Development Center
EIP	Experiment Implementation Plan
ERD	Experiment Requirements Document
EIRD	Experiment Integration Requirements Document
ICD	Interface Control Document

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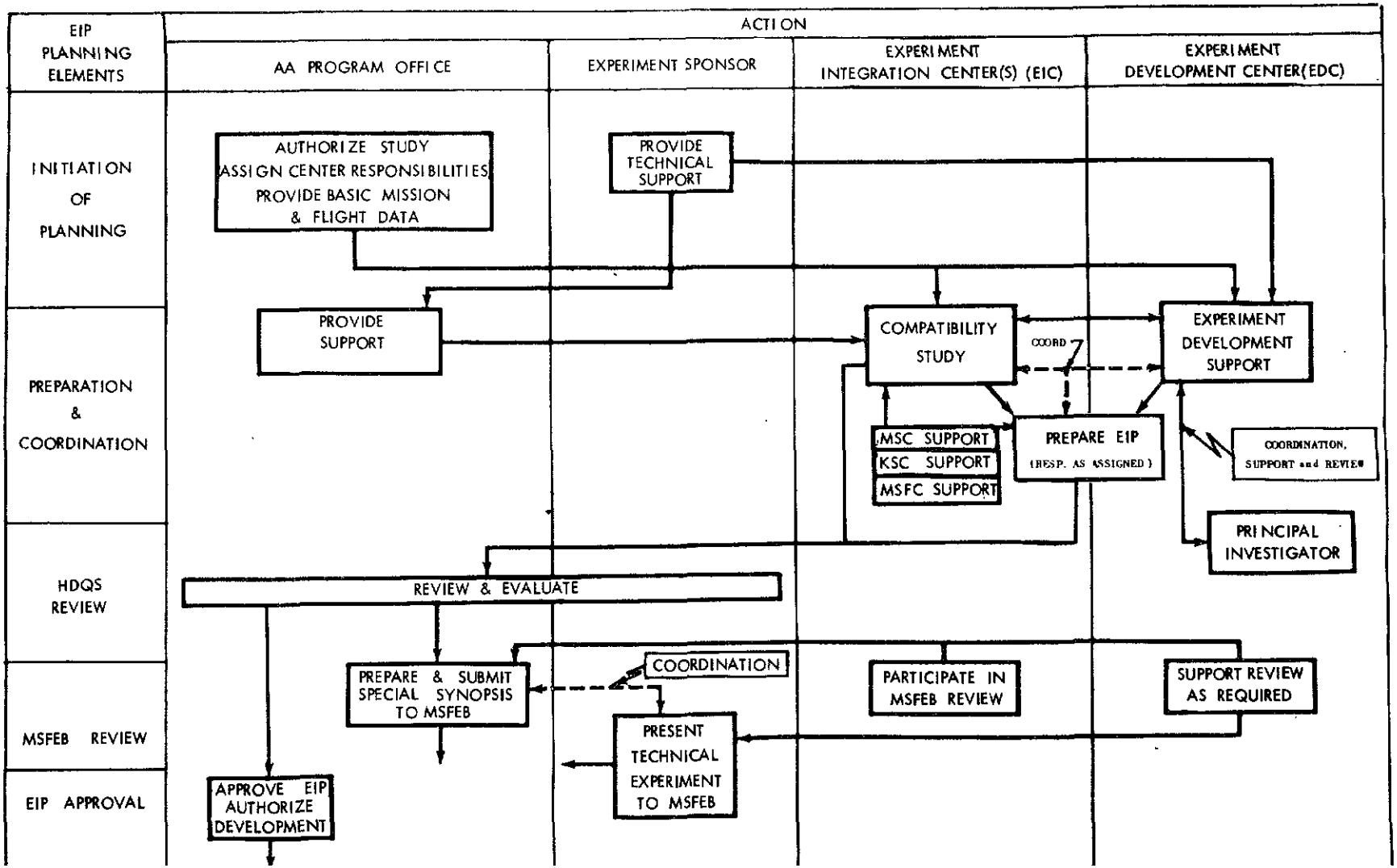
AAP EXPERIMENT PROGRAM

EXPERIMENT IMPLEMENTATION PLAN (EIP)

PREPARATION AND APPROVAL CYCLE



AAP EXPERIMENT DEVELOPMENT MANAGEMENT